APPLICATION FOR PATENT

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TITLE: APPARATUS FOR FADING TEXTILES, AND METHOD OF USE

SPECIFICATION

Field of the Invention

[0001] The present invention relates to an apparatus and a method of using it to artificially wear and fade textile materials. More particularly, the present invention relates to an apparatus comprising artificial abrasive stones attached to the inside surface of a chamber, and a method of using the apparatus to stonewash a textile material.

Background of the Invention

[0002] The technique of stone washing is used to wear and fade garment materials during the manufacturing process. Typically, stone washing involves placing a quantity of loose pumice stone into a chamber together with the garment material, and tumbling the garment with the pumice stone for a set period of time. Pumice stone, however, is expensive and is generally limited to one or two stone washing cycles. More importantly to the present invention, pumice stone does not maintain its physical integrity during use, but rather disintegrates, creating large amounts of waste.

[0003] While pumice stone is not highly durable, its use as a free stone in the chamber during the stone washing method only compounds its propensity to break apart. More specifically, the pumice stone tends to bump into other free pumice stones in the chamber, thereby causing the stones to break apart. Thus, the use of pumice stone produces large amounts of effluent residue, which attaches to the garment material and requires large amounts of water to remove. Pumice stone is therefore environmentally unfriendly and necessitates high labor expense.

[0004] Additionally, pumice stone generally has an uneven shape, which can result in the garment material having uneven wear and fade patterns. Furthermore, the abrasion effect can be very uneven, which can produce large amounts of damaged material.

[0005] Thus, there is a demonstrated need for a durable, environmentally friendly, inexpensive, evenly shaped, and multi-use abrasive stone for providing textile materials with a stone wash effect

Summary of the Invention

[0006] In accordance with the present invention, there is provided an apparatus for providing a textile material with a stonewashed effect. The apparatus includes a plurality of artificial abrasive stones attached to the inside surface of a chamber or wash drum. The artificial abrasive stones are fabricated from a material comprising carbon silicon, clay, resin and a foaming agent. The chamber has an inside surface with holes therethrough for receiving a connector device attached to the artificial abrasive stone. The connector is adapted to be releasable from the inner surface hole of the chamber, thereby allowing the apparatus user to easily and conveniently replace the artificial abrasive stones as needed.

[0007] Therefore, in accordance with a general embodiment of the present invention, there is provided a method for providing the textile material with a stonewashed effect. The method comprising attaching the abrasive stones to the inner surface of the chamber and then adding the textile to the chamber. The chamber is then moved in such a manner as to cause the textile and attached stones to make contact, and, thus, result in the textiles having a stone washed effect.

[0008] In another embodiment, the chamber is provided with the artificial abrasive stones attached to the chamber, and additional components such as smaller artificial abrasive stones, rubber balls, and/or grind stones are added to the chamber together with the textile material. The textile material is then processed to have a stone washed appearance by operably moving the chamber in such a manner that the textile contacts the attached and freely added stones, any other components.

[0009] In a further embodiment of the present invention, the artificial abrasive stone is made from materials comprising carbon silicon, clay, resin and foaming agents. The abrasive stones can be formed having a constant size and shape, and, thus, can work with many types of textile materials, such as pure cotton. The artificial abrasive stones are durable and can be used in a significantly more washes than pumice stone.

[0010] Other embodiments, features and advantages of the present invention will become apparent from a review of the detailed description of the preferred embodiments, including the illustrative drawings and the appended claims which follow.

Brief Description of the Drawings

[0011] FIG. 1 is a perspective view of an artificial abrasive stone of the present invention.

[0012] FIG. 2 is a top view of the apparatus of the present invention showing a chamber with artificial abrasive stones attached to the inner surface of the chamber.

[0013] FIG. 3 is a view of a portion of the inside surface of the chamber with attached artificial abrasive stones of the present invention.

Detailed Description of the Preferred Embodiments

[0014] The present invention will now be better understood below by reference to the attached figures. Referring to FIGS. 1 through 3, there is shown an embodiment of the apparatus of the present invention comprising artificial abrasive stones 10 attached to a chamber 20 used to treat textile material. As illustrated, the stone 10 has a rounded upper surface 18 and extending from the bottom surface 16 is a steel bolt 12 with mating nut 14 for connecting upper surface 18, it should be understood that the stone 10 can be made in any shape. Thus, the stones 10 can be molded in different shapes for creating various abrasion effects and for use with different types of textile materials.

[0015] As shown in FIG. 1, the stone 10 is coupled to a connector 24 comprising a bolt 12 and nut 14 combination. It is preferable that when attaching the stone 10 to the chamber 20 using a bolt and nut connector 24 that the connector 24 be made from stainless steel to prevent the connector 24 from corroding, which could hinder removal of the stone 10 and damage the textile material. It should therefore be understood that various non-corroding materials can be used to attach the stone 10 to the chamber 20 without deviating from the scope of the present invention. Additionally, numerous types of connectors can be used to attach the stone 10 to the chamber 20. For instance, would could provide the stones with a threaded element and provide the chamber with fixed screws to allow one to simply screw the stone onto and off of the fixed screw. Alternatively, one could use a rubber plug having a first end set into the stone 10 and a second end adapted to be pressed into the opening 30 to secure the stone 10 to the chamber surface 26. It should therefore be understood that there

exist a multitude of ways of attaching the stone 10 to the chamber 20 that can be used without deviating from the scope of the present invention.

[0016] In another preferred embodiment, the user is able to separate the connector 24 from the stone 10. In this embodiment, the stone 10 is fabricated with a central threaded portion (not shown) extending through the stone 10. The bolt 12 is then threaded from the upper surface 18 of the stone to the bottom surface 16 of the stone. In this way, the bolt 12 is passed through the stone 10 so that one end of the bolt is exposed on the uppers surface 18 of the stone and the bolt second end extends from the bottom surface 16 of the stone 10 for engagement with the chamber inner surface opening 30. In a preferred use, the bolt 12 is simply unthreaded from the stone 10 and the free stone 10 is used as an unattached stone that can be placed directly into the chamber 24. In this way, as the stone 10 begins to become worn it can be recycled and used again in a stonewash method using unattached stones in the wash chamber 20.

[0017] The artificial abrasive stones are preferably fabricated from a composition comprising carbon silicon, clay, resin and foaming agents. In a preferred embodiment, a quantity of carbon silicon powder is mixed with a clay, resin and a foaming agent. The mixed materials are then placed into a mold having the desired size and shape, and the mixture is heat cured in the range of 200°C to about 1300°C for a set period of time. During the curing process, the foaming agent acts to provide the carbon silicon stone with porosity, which results in the outer surface 18 being abrasive.

[0018] Fabricating the abrasive stones from carbon silicon provides stones that are durable and long lasting. Pumice stones are limited to one to two washings; however, artificial stones added freely to the chamber 20 can last up to 10 times. Additionally, the artificial abrasive stones attached to the inner surface 26 of the chamber 20, and fabricated from the material comprising carbon silicon, clay, and resin can last up to 500 washes. Additionally, the cured stone can be safely used with washing chemicals, such as dyes, fabric softeners, and detergents.

[0019] It should be understood by one skilled in the art, that how hard, brittle, abrasive or porous the stone 10 is depends upon the concentration of the components used to fabricate the stone 10. Furthermore, it is preferred that the stone be sized such that the uppermost portion of the upper surface be from about 0.75 inches to about 1.25 inches from the inner surface 26 of the chamber 20.

[0020] Referring to FIG. 2, there is illustrated a top view of the chamber 20 with the abrasive stones 10 of the present invention attached to the chamber inside surface 26. As will be understood by those skilled in the art, the chamber 20 can be an industrial wash drum, or other textile tumbling chamber known to one skilled in the art. More particularly, one can attach the artificial abrasive stones 10 to any of the many chambers, drums, or tumblers used to treat textile materials without deviating from the scope of the present invention. It is important, however, that the type of chamber to which the stones 10 are attached provide consistent contact between the stones 10 and the textile being treated to ensure the material has an even stonewash effect.

[0021] In the preferred embodiment, the stones 10 are attached to the chamber inside surface 26 by passing the connector 24 through an opening 30 that is provided through the chamber inside surface 26. As described above, the connector 24 is preferably a stainless steel bolt 12 with nut 14. Thus, the stone 10 is attached to the chamber surface 26 where it remains fixed during the stonewash method. In another embodiment, the surface 24 of the chamber 20 can further include an abrasive liner or other abrasive material, such as sandpaper (not shown).

[0022] Referring to FIG. 3, there is shown a side view of the inside surface 26 of a portion of the chamber 20. As illustrated, the stones 10 can be symmetrically attached to the inside surface 26 of the chamber 20, or alternatively, the stones 10 can be attached to the chamber 20 in an asymmetrical fashion. In another embodiment, the attached stones 10 can have different sizes and shapes so as to provide the textile material with an assortment of abrasion effects.

[0023] A preferred method for using the artificial abrasive stones 10 requires attaching the stones 10, of the same or different sizes, to the chamber inside surface 26. Because the connector 24 is preferably releasable, the user can easily and conveniently adjust the stones 10 as may be desired. Once the correct stone size or orientation is selected and the stone 10 is attached, the user places the textile material to be treated into the chamber 20. The chamber 20 is then placed into moveable operation for a set period of time. It will be understood by those skilled in the art that the type of chamber 20, time of operation, means for operating the chamber and many other operational factors can be adjusted without deviating from the scope of the present invention.

[0024] Those skilled in the art will understand that presently used wash machines have chambers or drums that have openings 30 through their inner surface. As such, the presently described artificial abrasive stones with connectors can be used to retrofit existing chambers for the purpose of practicing the present invention. More particularly, the stones 10 can be fabricated to order having bolts dimensioned to fit into the openings through existing inner surface of existing chambers. Once inserted the stone is fixed by securing the nut about the bolt.

[0025] In another preferred embodiment, the chamber 20 having attached stones 10 is used to treat textile material together with a quantity of free artificial stones and/or rubber balls. In even another embodiment, the user adds a quantity of grind stone to the chamber 20 to add even another variety of textile material abrasion. Again, it should be understood by those skilled in the art that the quantity of additional components added to the chamber 20 will depend upon the fabric type and the degree of wear and fade that is desired. An example protocol for providing a textile material with a stone washed effect is as follows:

[0026] SAMPLE WASH

- Provide a chamber or wash drum in operation with a 500lb wash machine.
- Attach about 1,000 artificial abrasive stones to the chamber inner surface.
- Place into the chamber as free components: 200 artificial abrasive stones being sized such that one of the freely added stones occupies less volume than one of the attached abrasive stones.
- Place into the chamber as free components: 100 rubber balls, and two kilos. of grind stone.
- Place around 200-250 pieces of heavy type blue indigo jeans into the wash machine chamber.

For this wash example, add all the stone, jeans and a quantity of enzyme at room temperature and let sit for 5 minutes, then ramp up the temperature over a period of 5 minutes to 55° to 65°C, then over a period of 5 – 10 minutes increase the temperature to 85°C, followed by a rinse. Following the rinse, the jeans or other textile are removed for finishing or further treatment, such as bleaching or coloring.

[0027] Various embodiments of the present invention have been described herein. It should be understood by those of ordinary skill in the art, however, that the above described

embodiments of the present invention are set forth merely by way of example and should not be interpreted as limiting the scope of the present invention, which is defined by the appended claims. Many other alternative embodiments, variations and modifications of the foregoing embodiments that embrace various aspects of the present invention will also be understood upon a reading of the detailed description in light of the prior art. For instance, it will be understood that features of one embodiment may be combined with features of other embodiments while many other features may be omitted (or replaced) as being nonessential to the practice of the present invention.